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(54) Title: TARGETING OF GENETIC VACCINE VECTORS

(57) Abstract

This invention provides methods of obtaining reagents for increasing the specificity of genetic vaccines for a desired target cell or tissue type. The invention also provides delivery vehicles for use to improve genetic vaccine specificity for a target cell or tissue type.

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**INTERNATIONAL SEARCH REPORT**

Interr	ial Application No
PCT/US 99/03023	

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 6 C12N15/87 C12N15/62 C12N15/10 A61K48/00 //C07K14/28,  
 C07K14/24

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 6 C12N C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 20078 A (AFFYMAX TECH NV ;CRAMERI ANDREAS (US); STEMMER WILLEM P C (US)) 5 June 1997 (1997-06-05) abstract page 6, line 20 - page 9, line 9 page 58, line 3 - page 59, line 10 claim 1 ---	1-50
A	WO 94 25608 A (BAYLOR COLLEGE MEDICINE) 10 November 1994 (1994-11-10) abstract page 5, line 28 - line 30 page 7, line 1 - line 19 examples 1-12 claims 1-19 figures 1-4 --- -/-	1-17

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 September 1999	22.09.1999
Name and mailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016	Authorized officer  Galli, I

## INTERNATIONAL SEARCH REPORT

Intell.	1st Application No
PCT/US 99/03023	

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 91 07979 A (INNOVATIVE TECH CENTER) 13 June 1991 (1991-06-13) abstract claims 1-19 ---	18-23
A	EP 0 125 228 A (HARVARD COLLEGE) 14 November 1984 (1984-11-14) abstract ---	21
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A	WO 95 16027 A (BIOINVENT INT AB ;BORREBAECK CARL A K (SE); DUENAS MARTA (CU)) 15 June 1995 (1995-06-15) abstract figure 1 claims 1-5 ---	24-45
A	WO 94 26787 A (UNIV LEELAND STANFORD JUNIOR) 24 November 1994 (1994-11-24) abstract figures 1,2 claims 1-14 ---	24-45
A	WO 97 11605 A (DANA FARBER CANCER INST INC ;UNIV PITTSBURGH (US)) 3 April 1997 (1997-04-03) abstract ---	24-45
A	WO 96 13250 A (AMGEM INC) 9 May 1996 (1996-05-09) abstract page 1 - page 5 examples 1-3 claims 1-23 ---	46-50
A	WO 96 23882 A (UNIV ROCKEFELLER ;STEINMAN RALPH M (US); NUSSENZWEIG MICHEL C (US)) 8 August 1996 (1996-08-08) abstract page 3, line 1 - page 4, line 7 claims 28-32 ---	1-50
A	WO 97 35957 A (MAXYGEN INC ;STEMMER WILLEM P C (US)) 2 October 1997 (1997-10-02) abstract page 5, line 5 - line 30 claims 32-41 ---	1-50
	-/-	

## INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/03023

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATTEN P A ET AL: "APPLICATIONS OF DNA SHUFFLING TO PHARMACEUTICALS AND VACCINES" CURRENT OPINION IN BIOTECHNOLOGY, vol. 8, 1997, pages 724-733, XP002916609 the whole document -----	1-50

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 99/03023

### Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: (1-17) - complete

A method for obtaining a binding molecule useful for increasing the uptake or specificity of a genetic vaccine to a target cell, the method comprising:

    creating a library of recombinant polynucleotides by recombining (i) nucleic acids that encodes a polypeptide comprising a nucleic acid binding domain, and (ii) nucleic acids that encode a polypeptide comprising a cell-specific binding domain; and

    screening the library for a molecule that can bind to a nucleic acid and to a cell-specific receptor.

2. Claims: (18-23) - complete

A method for obtaining an optimized cell-specific binding moiety useful for increasing uptake, efficacy or specificity of a genetic vaccine for a target cell.

Said method, involving recombination of different polynucleotides encoding a receptor-binding moiety of *V. cholerae* CT-B enterotoxin.

3. Claims: (24-45) - complete

A method of obtaining a genetic vaccine component that confers upon a vector an enhanced ability to enter an antigen-presenting cell, the method comprising:

    creating a library of recombinant nucleic acids by subjecting to recombination at least two forms of a polynucleotide,

    contacting a library of vectors, each of which comprises a member of the library of nucleic acids created above, with a population of antigen-presenting or antigen-processing cells,

    and determining the percentage of the cells that contain the vector.

4. Claims: (46-50) - complete

Idem as subject matter 2, but involving recombination of different polynucleotides encoding bacterial invasin.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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PCT/US 99/03023	

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